Hatfield Associates representing AT&T and MCI in hearings that concluded on May 17. Version 2.2 of the Hatfield Model contains the old incorrect digital switching values. However, even when the values are increased by the $60 per line proposed in California, the Hatfield Model still calculates a total digital switch investment of only $3.2 billion or about 75% of the projected Pacific Bell digital switch investment.

B. The Hatfield Model understates loop investment.

The builders of the Hatfield Model acknowledge that the BCM-1 loop module within the model understates investment and that patches must be added to other modules to correct for the errors. The Hatfield Model attempts to rectify some of these problems of missing drop, terminal (pedestal) and SAI investments within other modules. It does not, however, make any adjustments for other missing costs such as engineering costs and cable splicing costs.

Fundamentally, the loop module does not model the way distribution plant is engineered and placed. It assumes that the distribution service area is square, has a uniform population spread within the area and can be served by only four cable runs that each measure three-fourths of the length of the sides of the assumed square distribution area. This is not how distribution plant is placed. The cable in the area must run along each rural road -- not just four of the roads and the length of the cable run and the supporting structure (poles and conduit) must go to the last house located down each of those roads. Cable runs do not end at three-fourths of the length of an imaginary square's side. Real serving areas have mountains, lakes, and rivers. These and other features will cause population clusters that the Hatfield Model ignores.

While the above problems are serious, the worst problem with the Hatfield loop module is that it estimates the cost of cable material only, and multiplies that cost by a cable multiplier to determine all other loop investments. Cable material accounts for only about 20% of the total loop investment. Attempting to estimate the total loop investment including structures, engineering, and labor by a factor that accounts for 80% of the total is unreliable at best and probably wrong in most instances. There is also no way to validate within the module or the documentation that the cable multiplier factors correctly capture the total investment.

To test the cable multiplier factors, Pacific analyzed the Hatfield Model with the Cost Proxy Model and actual engineering results for feeder cable in the rural Angels Camp, California wire center. The feeder lengths were adjusted so that the same feeder length was used in all three cases. The results of the study for the Hatfield Model were $28,767 for 12,376 feet of feeder, which is $2.32 per foot. The CPM results were $173,666 or $14.03 per foot and the real world engineering estimate was $140,043 or $11.32 per foot. The results for the Hatfield Model are highly problematic and suggest that the cable multiplier factors significantly understate structure and labor costs. Despite the integral nature of the cable multiplier factor and its apparent role in grossly understating costs in the Angels Camp analysis Pacific has been refused access to the underlying data that would allow a review of the factors. One problem with the Hatfield Model that became obvious during the Angels Camp analysis is that when the Hatfield Model applies its 20% vendor discount factor to the price of cable material it simultaneously affects the cost of structure and labor, lowering these items by 20%. This makes no sense, since the costs of structures and labor are completely unrelated to the vendor price for the cable.

Loop plant is the major investment item for universal service. It represents over $9.5 billion, or 40% of Pacific's total assets. The BCM-1 loop module within Hatfield was never intended, and therefore lacks the sophistication necessary, to model how loop investment is placed and fails to accurately calculate loop investment.

C. The Hatfield Model understates the costs of support structures (poles and conduit).

The builders of the Hatfield Model clearly acknowledge that the BCM-1 loop module understates the costs of support structures. This latest version of the model selectively increases the structure costs in sparsely populated areas (documentation, page 14). This is a new modification and the filed documentation is insufficient to explain it. This latest adjustment does raise a significant concern. What data did the builders rely upon to determine the size of the error in structure costs? Also, since the builders of the Hatfield Model are aware that the loop module understates loop investment, why do they continue to incorporate the loop module in the Hatfield Model? Proponents of the Hatfield model should construct a new loop investment module, instead of putting patches upon patches in the current module.

Of even greater concern is what the documentation for the Hatfield Model fails to divulge concerning structure costs. Within the cost calculations, the Hatfield Model makes an unexplained adjustment to the calculated investments for support structures that reduces the investment by 67%. For Pacific Bell, this adjustment lowers the total loop investment by about 15%, from $5.8 billion to $5.0 billion. Only after extensive review of the internal Hatfield Model calculations can this adjustment be detected. This adjustment and the

discrepancy between the digital switch investment used in California compared to the FCC filing raise serious questions about the Hatfield Model.

III. Comparison of results between the Hatfield Model and the Cost Proxy Model.

The previous sections have discussed the numerous problems in the Hatfield Model that cause it to underestimate the investments and expenses required to provide universal service. Below are two tables that compare the cost and investment results for Pacific Bell using the Hatfield Model and the Cost Proxy Model.

The largest difference between the two models is the investment per line. The Hatfield Model calculates an investment that is half the amount in the CPM. This investment difference causes the capital costs for the Hatfield Model on Table 1 to be less than half the CPM value. Capital costs account for about $7 of the difference between the Hatfield's total cost of $15.12 and the CPM's $26.33.

The Hatfield Model costs results for loop maintenance and network operations are close to the CPM values. Network operations include power, network administration, testing, plant operations administration and engineering. As described in footnote 5 of Table 1, the Hatfield Model appears to significantly overstate the loop maintenance costs for the network interface device. Maintenance for NID represents about 65% of the loop maintenance. The model is applying an inappropriate maintenance cost factor to the NID investment that is causing the

error. The Hatfield Model cost for network operations is $2.23 per line compared to CPM's $1.91. Network operations is one of the few items that the Hatfield Model calculates as a per line expense from ARMIS data rather than using a cost factor. In the California universal service proceeding, Pacific pointed out that the Hatfield Model per line calculated value was about twice the Pacific Bell proposed value. The Hatfield Model is now adjusting the ARMIS calculated Network Operations value but the logic and rationale are not explained in the documentation.

TABLE 1
EXPENSE COMPARISON

	Expense	Hatfield Model Estimates Per Line Per Month	CPM Per line Per Month	Total Annual Hatfield Model Understatement
1	Switch Maintenance	$ 0.34	$0.50	$ 19 Million
2	Loop Maintenance	$2.46	$2.48	$ 2 Million
3	Network Operations and other Misc. items	$2.23	$1.91	($ 37 Million)
4	Capital Costs -- (return, depreciation, and income taxes)	$6.15	$13.26	$ 828 Million
5	Customer Service	$1.22	$3.39	$ 253 Million
6	Directory Assistance and O- calls	$0.07	$1.04	$ 113 Million
7	White Page Directory	$0.15	$0.31	$ 19 Million
7	Service Connection and Disconnect	$0.63	$1.51	$ 102 Million
8	Overheads/Common Costs	$1.51	$1.90	$ 45 Million
9	Uncollectables	$0.36	Note 6	($ 42 Million)
	Total	$15.12	$26.33	$ 1302 Million

Notes:

1. Hatfield understatement calculated using 9,699,788 residential lines.
2. Network Operations includes Network Support and maintenance expense for building, tandem switching and signaling in addition to Network Operations
3. Logic and calculations for service connection could not be confirmed from model documentation. Value shown is the residual between the total and the other items.
4. The Hatfield Model initially calculates the costs of Network Operations at $3.22 per line per month. However, later within the model the value is reduced to $1.96. The logic for this adjustment is not known to Pacific.
5. The Hatfield Model appears to significantly overstate the maintenance costs for the network interface device, NID within loop maintenance. The expense per line per month for the NID is $1.58 of the total $2.46 for loop maintenance.
6. Pacific believes uncollectibles should be reflected by reducing the revenues in the subsidy calculation instead of as an increase to the costs.

TABLE 2
LOOP INVESTMENT COMPARISON

	Unit Investment	Hatfield Model Estimates per line	CPM Per line	Total Hatfield Model Understatement
1	Feeder	$ 25.28	$ 87.69	$ 605 Million
2	Distribution	$ 155.06	$ 285.71	$ 1,267 Million
3	Support Structures	$ 22.31	$ 90.91	$ 665 Million
4	Loop Electronics	$ 67.10	$ 139.69	$ 704 Million
5	Total Loop Investment	$269.75	$604.00	$ 3,242 Million
6	Traffic Sensitive Switching	$104.76	$122.22	$ 169 Million
7	Non-traffic Sensitive Switching	$44.90	$119.89	$ 727 Million
8	Total Switching	$149.67	$242.11	$ 897 Million
9	Total Investment	$419.42	$846.11	$ 4,139 Million

Notes:
1. Hatfield understatement calculated using 9,699,788 residential lines.
2. Hatfield Model assumes 70% of end office switching is traffic sensitive.
3. If the structure investment deleted in the Hatfield Model (67% deleted) was included, Hatfield investment would increase by $45.30 per line, $439 million total.
4. If the Hatfield Model used the switching investment testified to in California, switching investment would increase by $60 per line and the total would increase by $582 million.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

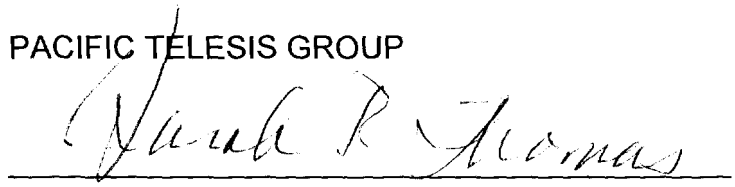
In the Matter of Federal-State Joint Board on Universal Service	CC Docket No. 96-45

ERRATUM OF PACIFIC TELESIS GROUP

Pacific Telesis Group submits this Erratum to the "Comments of Pacific Telesis Group," which it filed on August 2, 1996 in response to the 72 new questions posed by the Joint Board. After preparing the service copies of the Comments, Pacific discovered a few errors. To correct those errors, PTG submits the attached revised Comment pages and requests that they be substituted for the original.

Respectfully submitted,

PACIFIC TELESIS GROUP



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17. How should discounts be applied, if at all, for schools, libraries and rural health care providers that are currently receiving special rates?

If the Commission implements our proposal to allocate purchasing credits directly to eligible institutions, those already receiving special rates could use the credits as payment for their existing services or to purchase additional services at the existing, discounted rates. Where the institutions use purchase credits to pay for existing services, the carriers receiving the credits should be allowed to redeem the credits for cash, just as they would if the purchase credits were used to fund new purchases.

18. What states have established discount programs for telecommunications services provided to schools, libraries and health care providers? Describe the programs, including the measurable outcomes and the associated costs.

The CPUC has approved a (provisional) Pacific Bell tariffed discount to libraries and educational institutions called Knowledge Network ISDN (KN-ISDN). This service allows up to five lines of ISDN service at any eligible institution to receive unlimited local usage for a fixed price. The tariff has only been in effect for a few months, hence no measurable outcomes have been discerned. The CPUC allows services to be provided to schools and health care providers under customized contracts.

Pacific Bell also has in effect a master purchasing contract with the State of California which offers pricing on a wide array of services based on competitive prices. All public libraries and educational institutions (as well as governmental agencies) are able to purchase services from Pacific Bell under the aegis of this agreement.

Pacific Bell also established the California Research and Education Network (CalREN) program as a charitable trust to fund certain high speed digital transport services used by health care providers, educational institutions and others engaged in special applications research, for a period of up to three years. The program enabled 385 educational institutions to experiment with the value of ISDN, Frame Relay, SMDS and other high speed information transport technologies. The program, now expired, was funded with $25 million of shareholder funds. The trust then gave the money to institutions to pay Pacific Bell for the telecommunications services.

The flagship of Pacific Bell's education discount programs is called Education First. This program offers public and not-for-profit private K-12 institutions, libraries and community colleges a 100% discount on the installation and twelve months of recurring service rates and usage for up to five lines of ISDN used for telelearning or telecomputing applications (including Internet access). In effect since December of 1994, approximately fourteen hundred eligible institutions in Pacific Bell's operating area have installed ISDN service under the terms of this program, and another 1000-odd applications are currently being processed. Enhancements planned for this program include (1) an extension of the application deadline from 12/31/96 to 12/31/97 (filed July 8, 1996), and (2) an expansion of the available technologies to include Frame Relay and Primary Rate ISDN (PRI). It is still premature to suggest statistically significant measurable outcomes, but users of the program -- which includes free training seminars on both technology and learning applications -- report improved student interest as well as strong community support of opportunities for children to develop new, information age skills needed for modern careers. Pacific estimated the

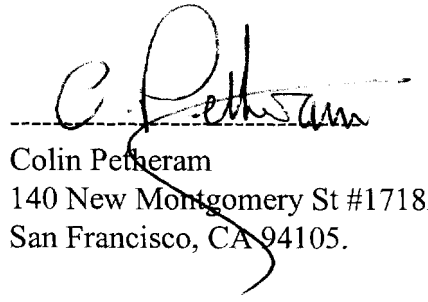
value of its Education First program to be $100 million. Thus far about $15 million dollars of that total have been consumed.

19. Should an additional discount be given to schools and libraries located in rural, insular, high cost and economically disadvantaged areas? What percent of telecommunications services (e.g., Internet services) used by schools and libraries are or require toll calls?

We would support the concept of providing additional purchasing credits to schools which would otherwise have a significantly higher net cost (actual price less credits) to procure a minimum critical mass of telecommunication services. In terms of our proposed "a+bx" fund allocation algorithm, we suggest that the "a" portion for such schools be set at a somewhat higher level for institutions located in areas in which the cost of network access is substantially higher. For economically disadvantaged schools, the "b" portion might be set slightly higher. We have no empirical data regarding the percentage of institutions which might require a toll call to reach the Internet. Such information would be better assessed from either the institutions themselves, or possibly Internet providers. Even so, we unofficially estimate that less than 10% of the schools in California will require a toll call to reach the nearest Internet provider. While we do not have an estimate for health care providers, we suspect the percentage is quite low since most of California's health care providers are concentrated in urban areas. Traditionally health care providers' calling patterns have been heavily weighted towards intraLATA calling, suggesting the providers generally

CERTIFICATE OF SERVICE

I, Colin Petheram, hereby certify that copies of the foregoing " Further Comments of Pacific Telesis Group on Cost Proxy Models" and "Erratum of Pacific Telesis Group" were served by first-class United States mail, pre-paid, upon the parties on the attached service list this 9th day of August, 1996.



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